REMARKS

Claims 1-24 are pending in the present application. By this Response, claims 6, 14 and 22 are amended for clarification purposes only to correct a typographical error. Reconsideration of the claims is respectfully requested in view of the above amendments and the following remarks.

I.   Allowable Subject Matter

Applicant thanks Examiner Tsai for the indication of allowable subject matter in claims 3, 4, 6-8, 11, 12, 14-16, 19, 20 and 22-24. However, for the reasons set forth hereafter, Applicant respectfully submits that all of the claims are directed to allowable subject matter and that the application is in condition for allowance.

II.   Telephone Interview

Applicant thanks Examiner Tsai for the courtesies extended to Applicant's representative during the March 3, 2004 telephone interview. During the interview, Applicant's representative set forth the distinctions of the present claims over the Karp reference. Examiner Tsai indicated that he understood the distinctions but reserved making a final determination as to whether the claims define over the prior art until he had additional time to review the references. The substance of the telephone interview is summarized in the following remarks.

III.   Objection to the Specification

The Office Action objects to the specification stating that the abstract is greater than 150 words in length, an error in a reference number is present on page 10, and that the cross-reference information on page 1 needs to be updated. Accordingly, by this Response, amendments are made to the specification to correct the typographical error on page 10, reduce the length of the abstract to less than 150 words, and to provide updated

information for the cross-reference U.S. Patent Applications. No new matter has been added by any of the amendments to the specification. In view of these amendments, Applicant respectfully requests withdrawal of the objection to the specification.

IV.   Objection to the Drawings

The Office Action objects to the drawings stating that Figure 7 needs to have the outputs from block 710 labeled with appropriate "Yes" and "No" labels. Accordingly, by this Response, Applicant submits a formal replacement drawing for Figure 7 in which "Yes" and "No" branches of step 710 are labeled appropriately. Applicant, therefore, respectfully requests withdrawal of the objection to the drawings.

V.   Claim Objections

The Office Action objects to claims 6-8, 14-16 and 22-24 because of a typographical error in claims 6, 14 and 22. By this Response, claims 6, 14 and 22 are amended to remove the duplicative article "the" in these claims. Accordingly, Applicant respectfully requests withdrawal of the objection to the claims.

VI.   35 U.S.C. § 102, Alleged Anticipation Based on Karp

The Office Action rejects claims 1, 2, 9, 10, 17, and 18 under 35 U.S.C. § 102(b) as being allegedly anticipated by Karp et al. (U.S. Patent No. 5,748,936). This rejection is respectfully traversed.

As to independent claims 1, 9, and 17, the Office Action states:

> Referring to claim 1, Karp et al. discloses as claimed, a method of handling exceptions in a device (a computer system 20, see Fig. 1) having predication (predicate file 50 and speculative look aside table (SLAT) 80, see Fig. 3), comprising: determining if an exception is pending based on values of a predicate register pair (in the general purpose registers 36, see Col. 5, lines 9-12); and handling the exception when it is determined that an exception is pending (see Fig. 7A, in block 256 YES condition when POISON BIT is set; and also see Col. 11, lines 61-62, regarding when the poison bit is set, the processor handles the exception).

Referring to claim 9, Karp et al. discloses as claimed, an apparatus for handling exceptions in a device (<u>a computer system 20, see Fig. 1</u>) having predication (<u>predicate file 50 and speculative look aside table (SLAT) 80, see Fig. 3</u>), comprising: means for determining if an exception is pending based on values of a predicate register pair (<u>in the general purpose registers 36, see Col. 5, lines 9-12</u>); and means for handling the exception when it is determined that an exception is pending (<u>see Fig. 7A, in block 256 YES condition when POISON BIT is set; and also see Col. 11, lines 61-62, regarding when the poison bit is set, the processor handles the exception</u>).

   <u>Note claim 17 contains the similar limitations as claims 1 and 9 which are disclosed by Karp et al. as set forth above. Further note that all the steps and means described in claims 1 and 9 are inherently implemented in a computer program as claimed.</u>

Office Action dated December 5, 2003, pages 4-5.

   Claim 1, which is representative of independent claims 9 and 17 with regard to similarly recited subject matter, reads as follows:

   1. A method of handling exceptions in a device having predication, comprising:
     determining if <u>an exception is pending</u> based on <u>values</u> of <u>a</u> <u>predicate register pair</u>; and
     handling the exception when it is determined that an exception is pending. (emphasis added)

   A prior art reference anticipates the claimed invention under 35 U.S.C. § 102 only if every element of a claimed invention is identically shown in that single reference, arranged as they are in the claims. *In re Bond*, 910 F.2d 831, 832, 15 U.S.P.Q.2d 1566, 1567 (Fed. Cir. 1990). All limitations of the claimed invention must be considered when determining patentability. *In re Lowry*, 32 F.3d 1579, 1582, 32 U.S.P.Q.2d 1031, 1034 (Fed. Cir. 1994). Anticipation focuses on whether a claim reads on the product or process a prior art reference discloses, not on what the reference broadly teaches. *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 218 U.S.P.Q. 781 (Fed. Cir. 1983). Applicant respectfully submits that Karp does not identically show every element of the claimed invention arranged as they are in the claims. Specifically, Karp does not teach determining if <u>an exception is pending</u> based on <u>values</u> of <u>a predicate register pair</u>.

Karp is directed to a system for supporting speculative execution using a speculative look-aside table or SLAT. With the system of Karp, a register files 32 are provided which include predicate registers and associated label storage. The predicate registers are one bit registers that may be either set or not set. When the predicate register is not set, i.e. its value is "0" or false, the associated instruction need not be executed. When the predicate register is set, i.e. its value is "1" or true, the associated instruction needs to be executed and the corresponding label is read (see column 9, lines 10-15 and column 10, lines 9-15). The label provides an index into the speculative look-aside table (SLAT) and is used to read the corresponding entry from the SLAT.

During an instruction decode stage of an instruction pipeline, the processor passes the number of the controlling predicate for the instruction to the predicate decoder and a corresponding entry, i.e. predicate register, in a predicate file is identified. If the predicate value in the entry is true, the corresponding label is read and is used to index into the SLAT to read a corresponding entry in the SLAT. Based on reading the entry in the SLAT, a determination is made as to whether a poison bit is set in the SLAT entry. The poison bit is set by an exception unit when an exception is being deferred (see column 10, lines 30-42). If the poison bit is set, the processor then handles the deferred exception.

Thus, Karp actually teaches that the predicate registers are only used to determine whether an instruction needs to be executed or not. The predicate registers are not used to determine whether an exception is pending. To the contrary, the poison bits, which are stored in a completely different data structure, i.e. the SLAT, are used to determine whether an exception is pending. There is no way to tell whether an exception is pending based on the predicate registers in Karp.

Furthermore, Karp does not teach that a determination as to whether an exception is pending is based on <u>values</u> of a predicate register <u>pair</u>. As mentioned above, the predicate registers in Karp are only used to determine if an instruction needs to be executed. Moreover, only a single predicate register is used for this purpose. This is clearly stated in column 10, lines 5-11 which read:

> During the decode stage, the processor inserts the number of the controlling predicate for the operation into the predicate decoder 100, and

the predicate decoder locates <u>the corresponding entry</u> in the predicate file (200).

     During the read stage, the functional unit (110, for example) reads <u>the 1 bit predicate value</u> and the n bit label from the predicate file (202). (emphasis added)

     Thus, at most, Karp teaches using a single predicate register to determine if an instruction needs to be executed or not. Karp does not teach determining if an exception is pending based on <u>values</u> of a predicate register <u>pair</u>. While Karp may teach determining if an exception is pending, this determination in Karp is based on the value of a poison bit in a SLAT entry of a SLAT table. Karp does not teach or even suggest to use predicate registers, let alone a pair of predicate registers, to determine if an exception is pending.

     In view of the above, Applicant respectfully submits that Karp does not teach each and every feature of independent claims 1, 9 and 17 as is required under 35 U.S.C. § 102(b). At least by virtue of their dependency on claims 1, 9 and 17, respectively, Karp does not teach the features of dependent claims 2, 10, and 18. Accordingly, Applicant respectfully requests withdrawal of the rejection of claims 1, 2, 9, 10, 17 and 18 under 35 U.S.C. § 102(b).

     Furthermore, Karp does not teach, suggest, or give any incentive to make the needed changes to reach the presently claimed invention. Karp actually teaches away from the presently claimed invention because it teaches using poison bits stored in a speculative look-aside table to determine if there are deferred exceptions opposed to using a pair of predicate registers to determine if an exception is pending, as in the presently claimed invention. Absent the Examiner pointing out some teaching or incentive to implement Karp such that a pair of predicate registers is used to determine if an exception is pending, one of ordinary skill in the art would not be led to modify Karp to reach the present invention when the reference is examined as a whole. Absent some teaching, suggestion, or incentive to modify Karp in this manner, the presently claimed invention can be reached only through an improper use of hindsight using the Applicant's disclosure as a template to make the necessary changes to reach the claimed invention.

In addition to the above, Karp does not teach the specific features recited in dependent claims 2, 10 and 18. Claim 2, which is representative of claims 10 and 18 with regard to similarly recited subject matter, reads as follows:

> 2.   The method of claim 1, wherein determining if an exception is pending includes determining if <u>a value of a first predicate register is true</u> and <u>a second predicate register is false</u>. (emphasis added)

As stated above, the predicate registers in Karp are not used to determine if an exception is pending. Furthermore, Karp teaches to use only a single predicate register to determine if an instruction needs to be executed or not. Karp does not teach using a pair of predicate registers to determine if an exception is pending. Thus, Karp cannot teach that determining if an exception is pending includes determining if a value of a first predicate register is true and a second predicate register is false, as recited in claims 2, 10 and 18.

The Office Action alleges that this feature is taught by Karp in Figure 7A and column 11, lines 41-43 and 51-52 because the controlling predicate may be set to true and the label may have a value of zero. These values of the controlling predicate and the label are not used to determine if an exception is pending. In other words, simply because the controlling predicate is set to true and the label is set to a zero value, it cannot be determined that an exception is pending. To the contrary, the value of "true" for the controlling predicate merely means that the corresponding instruction must be executed (see column 10, lines 11-13). The value of "zero" for the label merely means that the corresponding instruction is not speculative (see column 5, lines 51-56). The combination of a "true" value for the controlling predicate and a "zero" for the label does not impart any information regard whether or not an exception is pending. To the contrary, the only mechanism in Karp that identifies an exception being deferred is the poison bit in the SLAT entry.

Thus, despite the allegations made by the Office Action, Karp does not actually teach the features of claims 2, 10 and 18. Therefore, in addition to being dependent upon claims 1, 9 and 17, respectively, claims 2, 10 and 18 are also allowable over Karp by virtue of the specific features recited within these claims.

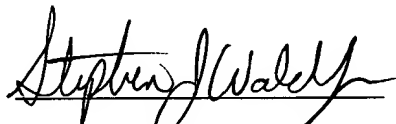## VII. 35 U.S.C. § 103, Alleged Obviousness Based on Karp

The Office Action rejects claims 5, 13, and 21 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Karp et al. This rejection is respectfully traversed for at least the same reasons as set forth above with regard to the rejections under 35 U.S.C. § 102(b). Specifically, Karp does not teach or suggest to use a pair of predicate registers to determine if an exception is pending, as recited in independent claims 1, 9 and 17, from which claims 5, 13 and 21 depend, respectively. As stated above, Karp actually teaches away from such a feature in that the predicate registers of Karp are only used to determine if an instruction needs to be executed, only a single predicate register is used for this purpose, and a completely different data structure from a pair of predicate registers is used to determine if an exception has been deferred, i.e. the poison bits in the SLAT entry. Accordingly, Applicant respectfully requests withdrawal of the rejection of claims 5, 13 and 21 under 35 U.S.C. § 103(a).

VIII. Conclusion

It is respectfully urged that the subject application is patentable over Karp et al. and is now in condition for allowance. The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the Examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

Respectfully submitted,

DATE: March 3, 2004

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